

B-1 SEDIMENT BARRIERS**PURPOSE & APPLICATIONS**

A sediment barrier is a temporary barrier installed across or at the toe of a slope. Sediment barriers may consist of filter fence, straw or hay bales, a berm of erosion control mix, or other filter materials. Its purpose is to intercept and retain small amounts of sediment from disturbed or unprotected areas.

The sediment barrier is used where:

- Sedimentation can pollute or degrade adjacent wetland and/or watercourses.
- Sedimentation will reduce the capacity of storm drainage systems or adversely affect adjacent areas.
- The contributing drainage area is less than 1/4 acre per 100 ft of barrier length, the maximum length of slope above the barrier is 100 feet, and the maximum gradient behind the barrier is 50 percent (2:1). If the slope length is greater, other measures such as diversions may be necessary to reduce the slope length.
- Sediment barriers shall not be used in areas of concentrated flows. Under no circumstances should hay bale or erosion control mix barriers be constructed in live streams or in swales where there is the possibility of a washout.

CONSIDERATIONS

- Sediment barriers are effective only if installed and maintained properly.
- Silt fencing generally is a better filter than hay bale barriers.
- If there is evidence of end flow on properly installed barriers, extend barriers uphill or consider replacing them with temporary check dams.
- Straw or hay bales should only be used as a temporary barrier for no longer than 60 days.
- Silt fences (synthetic filter) can be used for 60 days or longer depending on ultraviolet stability and manufacturer's recommendations.
- Sediment barriers should be installed prior to any soil disturbance of the contributing drainage area above them.

SPECIFICATIONS**Filter Fences**

This sediment barrier utilizes synthetic filter fabrics. It is designed for situations in which only sheet or overland flows are expected. Generally pre-manufactured synthetic silt fencing with posts attached is used. See the detail drawing located at the back of this section for the proper installation of silt fences.

- The filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier.
- The filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 degrees F to 120 degrees F.
- Posts for silt fences shall be either 4-inch diameter wood or 1.33 pounds per linear foot steel with a minimum length of 5 feet. Steel posts shall have projections for fastening wire to them.
- The height of a silt fence should not exceed 36 inches as higher fences may impound volumes of water sufficient to cause failure of the structure.
- The filter fabric shall be purchased in a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are necessary, filter cloth shall be spliced together only at support post, with a minimum 6-inch overlap, and securely sealed.
- Post spacing shall not exceed 6 feet.

- A trench shall be excavated approximately 4 inches wide and 4 inches deep along the line of posts and upgradient from the barrier.
- The standard strength of filter fabric shall be stapled or wired to the post, and 8 inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
- The trench shall be backfilled and the soil compacted over the filter fabric.
- Silt fences shall be removed when they have served their useful purpose, but not before the upslope areas have been permanently stabilized.

Straw/Hay Bales

See the detail drawing located at the back of this section for the proper installation of hay bales.

- Bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another.
- All bales shall be either wire-bound or string-tied. Bales shall be installed so that bindings are oriented around the sides, parallel to the ground surface to prevent deterioration of the bindings.
- The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches.
- After the bales are staked and chinked, the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be build up to 4 inches against the uphill side of the barrier. Ideally, bales should be placed 10 feet away from the toe of slope.
- At least two stakes or rebars driven through the bale shall securely anchor each bale. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or re-bars shall be driven deep enough into the ground to securely anchor the bales.
- The gaps between bales shall be chinked (filled by wedging) with hay to prevent water from escaping between the bales.

Problems with Straw or Hay Bale Barriers

There are three major reasons why straw bale barriers are not as effective as hoped they would be:

- When improperly placed and installed (such as staking the bales directly to the ground with no soil seal or entrenchment), hay bales allow undercutting and end flow.
- Inadequate maintenance.
- Inspection shall be frequent and repair or replacement shall be made promptly as needed. Bale barriers shall be removed when they have served their usefulness, but not before the up-slope areas have been permanently stabilized.

Erosion Control Mix Berms

Erosion control mix can be manufactured on or off the project site. It must consist primarily of organic material, separated at the point of generation, and may include: shredded bark, stump grindings, composted bark, or acceptable manufactured products. Wood and bark chips, ground construction debris or reprocessed wood products will not be acceptable as the organic component of the mix.

Composition

Erosion control mix shall contain a well-graded mixture of particle sizes and may contain rocks less than 4" in diameter. Erosion control mix must be free of refuse, physical contaminants, and material toxic to plant growth. The mix composition shall meet the following standards:

- The organic matter content shall be between 80 and 100%, dry weight basis.
- Particle size by weight shall be 100 % passing a 6" screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen.
- The organic portion needs to be fibrous and elongated.
- Large portions of silts, clays or fine sands are not acceptable in the mix.
- Soluble salts content shall be < 4.0 mmhos/cm.

- The pH should fall between 5.0 and 8.0.

Installation

- The barrier must be placed along a relatively level contour. It may be necessary to cut tall grasses or woody vegetation to avoid creating voids and bridges that would enable fines to wash under the barrier through the grass blades or plant stems.
- On slopes less than 5 % or at the bottom of steeper slopes (<2:1) up to 20 feet long, the barrier must be *a minimum of 12" high*, as measured on the uphill side of the barrier, *and a minimum of two feet wide*. *On longer or steeper slopes*, the barrier should be wider to accommodate the additional runoff.
- Frozen ground, outcrops of bedrock and very rooted forested areas are locations where berms of erosion control mix are most practical and effective.
- Other BMPs should be used at low points of concentrated runoff, below culvert outlet aprons, around catch basins and closed storm systems, and at the bottom of steep perimeter slopes that are more than 50 feet from top to bottom (i.e., a large up gradient contributing watershed).

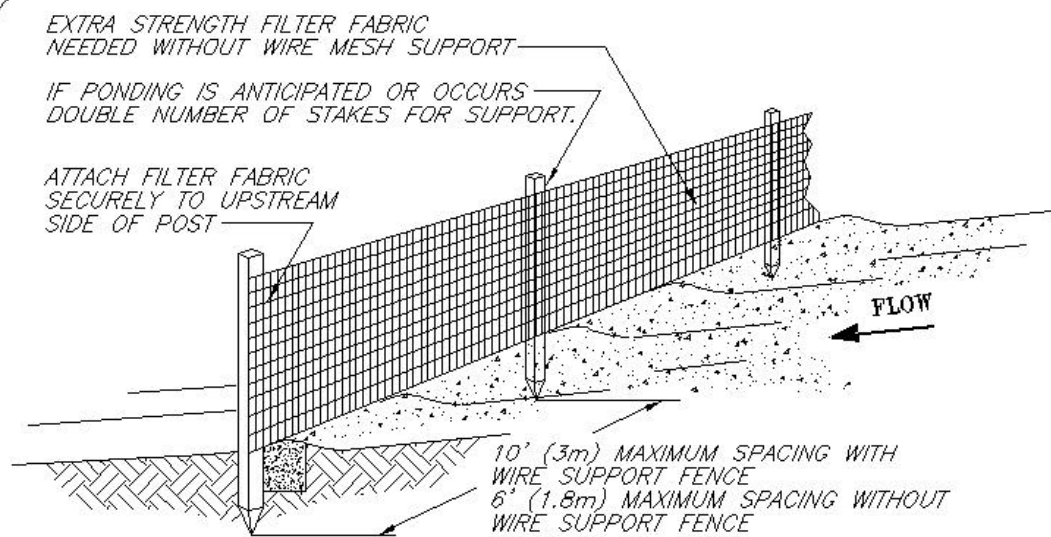
Continuous Contained Berms

A new product, the filter sock can be an effective sediment barriers as it adds containment and stability to a berm of erosion control mix. The organic mix is placed in the synthetic tubular netting and performs as a sturdy sediment barrier (a vehicle may drive over it without ill effect). It works well in areas where trenching is not feasible such as over frozen ground or over pavement. A continuous contained berm of erosion control mix may be effective when placed in waterways such as ditches and swales or in area of concentrated water flow as the netting prevents the movement and displacement of the organic material. See the detail drawing located at the back of this section for the proper installation of continuous contained berms.

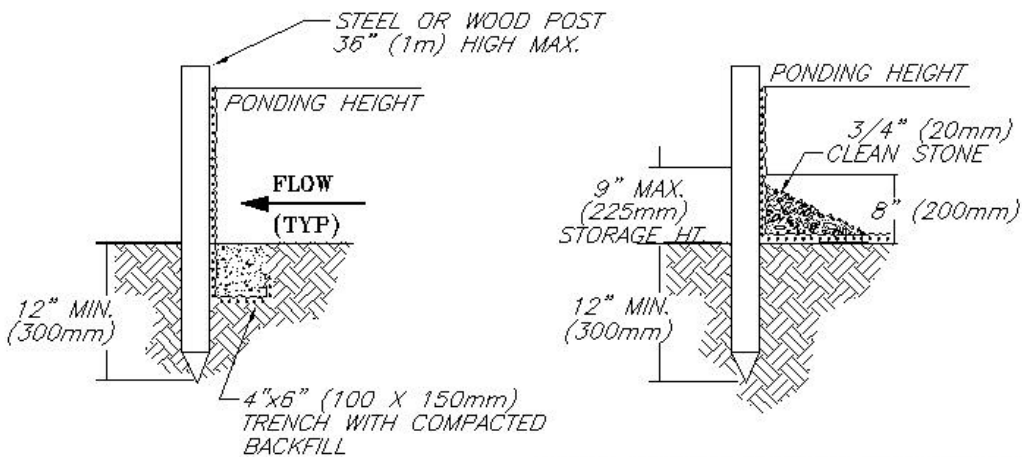
Seeds may be added to the organic filler material and can permanently stabilize a shallow slope. The containment will provide stability while vegetation is rooting through the netting.

MAINTENANCE

- Hay bale barriers, silt fences and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired immediately if there are any signs of erosion or sedimentation below them. If there are signs of undercutting at the center or the edges of the barrier, or impounding of large volumes of water behind them, sediment barriers shall be replaced with a temporary check dam.
- Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.
- Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.
- Filter berms should be reshaped as needed.
- Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required should be dressed to conform to the existing grade, prepared and seeded.



NOTE: PRE-FABRICATED SILT FENCE IS ACCEPTABLE IF INSTALLED PER MANUFACTURER.



TRENCH DETAIL

**LEDGE, FROZEN GROUND, HEAVY ROOTS
INSTALLATION WITHOUT TRENCHING**

NOTES:

1. SILT FENCE SHALL BE PLACED ON SLOPE
CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. INSPECT AND REPAIR FENCE AFTER EACH
STORM EVENT AND REMOVE SEDIMENT WHEN
NECESSARY. 9" (225mm) MAXIMUM
RECOMMENDED STORAGE HEIGHT.
3. REMOVED SEDIMENT SHALL BE DEPOSITED
TO AN AREA THAT WILL NOT CONTRIBUTE
SEDIMENT OFF-SITE AND CAN BE PERMANENTLY
STABILIZED.
4. DO NOT PLACE SILT FENCE IN STREAMS OR
CONCENTRATED FLOW CONDITIONS.

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SILT FENCE

